

width of the zigzag is uniformly narrow and almost equal to that of the required shape.

Therefore, the drawbacks of connections between the heat-generating part and electrodes is solved, and the resultant wire is matched with the power supply voltage because of its relatively fine and long structure.

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Applicant has also attached a marked-up version of the changes made to the specification to the end of this amendment to aid the Examiner in reviewing the changes made to correct the grammar and punctuation problems. As stated previously, no New Matter has been added to the Specification.

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Amendments to the Claims

15 Please amend the claims as follows:

1. (Rewritten) An impulse heat sealer comprising:
 - a. a power source;
 - 20 b. a heater circuit connected to the power source;

c. a press mechanism connected to the appropriate machine supporting mechanisms adapted to effect the actual sealing and material supporting functions; and

d. a heating wire; the heating wire being of unitary construction, self-supporting and adapted to receive current from the power source through electrode portions, and via a series of zigzags and gaps, effect a continuous heat seal on the material being sealed.

2. (Rewritten) The impulse sealer of claim 1, wherein the electrode portions of the heating wire are defined by shoulders that are non-symmetrical with respect to the longitudinal axis of the heating wire.

3. (Rewritten) The impulse sealer of claim 1, wherein the zigzags of the heating wire extend a significant portion of the length of the heater wire.

4. (Rewritten) The impulse sealer of claim 1, wherein the zigzags of the heating wire are spaced in a proximity with respect to each other such that when a seal is effected a unitary seal is obtained with no gaps therein.

5. (Rewritten) The impulse sealer of claim 1, wherein the function is that of a laminator.

Please add newly submitted Claims 6-24, as follows:

6. (Rewritten) The impulse sealer of claim 1, wherein the function is that of a book-binder.

7. A heater wire for use in an impulse sealer comprising:

a. a heat generating portion; and

b. electrode portions, the electrode portions located at the proximal and distal ends of the heat generating portion, wherein the heat generating portion is self-supporting and shaped into a desired uniform configuration for the impulse seal and the electrode portions are broadened to prevent heat generation therefrom such that the broadened portions forming the electrode portions are non-uniform in surface area as compared to each other with respect to the longitudinal axis of the electrode portion.

8. The heater wire of claim 7, wherein the heat generating portions of the heater wire are arranged proximal to a series of small gaps with respect to the heat generating portions thereof.

9. The heater wire of claim 7, wherein the heater wire is configured in a zigzag shape with gaps formed between each of the zigzag regions that disappear in the final heat seal effected by the heater wire.

10. The heater wire of claim 9, wherein the gaps are small in size and disappear in the heat seal product formed by the heater wire when the heater wire is used by an impulse sealer.

11. The heater wire of claim 7, wherein the heater wire is formed of a thin plate of electrically high resistance material.
12. The heater wire of claim 11, wherein the heater wire is formed from a thin plate of electrically high resistance material by a rolling process.
- 5 13. The heater wire of claim 11, wherein the electrically high resistance material is patterned by a photoetching process.
14. The heater wire of claim 7, wherein the heat-generating portion is formed from a thin plate of electrically high resistance metal such as iron chromium and equivalents thereof.
- 10 15. The heater wire of claim 7, wherein the heater wire is part of a laminating machine.
16. The heater wire of claim 1, wherein the heater wire is part of a book-binding machine.
17. A heater wire for use in an impulse sealer comprising:
 - 15 a. a heat generating portion, said heat generating portion being formed of a heater wire configured such that the wire forms a plurality of small gaps arranged a pre-determined portion of the extent of the heat generating portion such that the gaps disappear in the final seal effected by heat diffusion when the wire is used by
 - 20 an impulse heat sealer; and

b. electrode portions, located at the proximal and distal portions of the heat generating portion and adapted to be connected to an appropriate power source.

18. The heater wire of claim 17, wherein the gaps formed by the wire define a series of zigzags extending along a significant portion of the heat-generating portion.

19. The heater wire of claim 17, wherein the heater wire is formed of a thin plate of electrically high resistance material.

20. The heater wire of claim 19, wherein the electrically high resistance material has been strengthened by a tempering process.

21. The heater wire of claim 19, wherein the electrically high resistance material is patterned by a photoetching process.

22. The heater wire of claim 17, wherein the heat-generating portion is formed from a thin plate of electrically high resistance material such as iron chromium and equivalents thereof.

23. The heater wire of claim 17, wherein the heater wire is part of a laminating machine.

24. The heater wire of claim 17, wherein the heater wire is part of a book-binding machine.

Objections to Drawings

Applicant recognizes the problems with the drawings and has elected to amend
5 the claims to eliminate the language which prompted the need for drawing corrections.
This claim amendment, therefore, obviates the need for any drawing modifications.

Claim Objections

10 Due to the presentation of the newly drafted claims, Applicant feels that the
objections to the informalities of the previous claims have been overcome. The newly
presented claims have been rewritten to more clearly state the nature of the invention and
to remove unnecessary language which caused informalities. The newly presented claims
further define the instant invention in a much clearer form and thus improve and enhance
15 the understanding of the claimed subject matter. In addition, the newly presented claims
more accurately correspond to those presented in the Japanese and PCT applications so
they are considered more representative of Applicants' invention.

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112 Rejections

Applicant has rewritten claim 4 to reflect that the gaps formed by the bends in the
zigzag shaped wire are not present in the final heat seal because the construction of the

wire is such that the size of the gaps is small enough that they disappear due to heat diffusion in the material being heat sealed. Thus the objection to Claim 4 under 35 USC 112 is considered to be overcome and Applicant entreats the Examiner to remove the rejection accordingly.

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Joint Inventorship

Applicant respects the question about the inventorship and hereby stipulates that the inventorship as recorded is correct. Both of the Sakamotos are indeed co-inventors of the subject matter as herein claimed.

102 Rejections

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Applicant acknowledges the rejection under 35 USC 102(b) and with the changes to the claims presented with this Amendment believes that this rejection has been overcome. The Perrett heating wire is of solid construction which differs from a heater wire with “a series of zigzags and gaps” as presented in newly rewritten Claim 1. Newly presented Claim 17, also contains this limitation, although stated slightly differently.

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In addition, in Claim 7, the electrode portions are “non-uniform in surface area as compared to each other with respect to the longitudinal axis” which is not shown in

Perrett; the electrode portions of the reference are equal in surface area on both sides of the longitudinal axis.

For these reasons, the newly amended and presented claims are patentably distinct from the Perrett reference, and it is respectfully submitted that the rejection under 35 USC 102(b) should be withdrawn.

103 Rejections

The rejection of the claims based on Perrett in light of Carnegie, Jr. has been duly noted by Applicant. The Carnegie citation is provided to show (Fig. 3), a heat generating portion narrowed to form a gap between two heating sections that form a composite seal. With the new limitations that the heater wire is "configured such that the wire forms a plurality of small gaps," the rejection no longer applies. Carnegie only has one gap portion with a circular shaped heater wire that is of solid construction. It is therefore, respectfully submitted that the rejection under 35 USC 103 of Perrett in light of Carnegie no longer applies and should be withdrawn.

The rejection under 35 USC 103 of Perrett in view of Hager, Jr. is also considered to be overcome by Applicant with the amendments to the claims. Hager was cited by the Examiner to show another zigzag type of shape used in heating elements. The reference shows and describes a "foil" which is a totally different type of structure than Applicant's claimed "wire". In addition, Hager teaches in col. 3, lines 14-22 that a foil is necessary to effect the sealing function and that "rods, bars and coiled resistance wires cannot do" the

function necessary in the Hager device. The instant heating device is described and claimed as a “wire” and therefore is considered patentably distinct from the foil of Hager which is clearly taught away from by the reference. Thus, Applicant believes that the rejection of the claims under 35 USC 103 no longer pertains with the changes contained
5 in this Amendment.

The rejection of the claims under 35 USC 103 based on Perrett in view of Bergersen et al is also considered to be overcome by the newly amended claims. Bergersen was cited to show the process of making a heating element by a rolling process. However, again, the structure of Bergersen is not the same as the heating wire of the
10 instant invention. Bergersen using the rolling procedure to install fuses into a sheet material to act as fuses; Applicant’s heating wire contains no fuses in its structure. Therefore, it is respectfully submitted that the claims as presented are patentably distinct from the combination of Perrett and Bergersen et al.

The rejection under 35 USC 103 of the claims under Perrett in light of Solow is
15 also considered to be moot with the newly amended claims. Solow teaches the manufacture of a foil by annealing and the newly presented claims are clearly directed to a heater wire structure. Applicant’s structure again is that of a heater wire, differing from a “foil” construction. Therefore, Applicant believes that this rejection is no longer pertinent in light of the amendments to the claims.

20 The rejection of the claims under 35USC 103 citing Perrett in light of Hurko et al is additionally considered overcome by the amendments to the claims. Again the structure taught in the reference is a flat sheet and not a wire which is considered distinct.

Applicant's surface may be flat but is not considered to be a "foil" but a "wire". It is respectfully submitted that the rejection of Perrett in view of Hurko et al is no longer pertinent in light of the amendments to the claims.

5 The iron chromium rejection under 35 USC 103 is also considered overcome due to the fact the JP reference does not teach the claimed structure as presented.

The combination of the above references in combination with Weisz is also considered overcome by the instant claims as presented in this Amendment. The Weisz element is patterned and not a wire of unitary construction with a series of zigzags and gaps defining the self-supporting structure. The Weisz structure is a pattern on a
10 substrate and not free-standing in nature. Therefore, Applicant submits that the rejection of the claims under 35 USC 103 is no longer applicable.

The rejections of the claims with the combinations of all the references do not teach the invention as presented in the claims as herein presented for the reasons stated individually for each of the rejections above. It is respectfully submitted that the claims
15 are patentably distinct from the prior art for the reasons stated and therefore, the instant application is now in condition for allowance and the Applicant entreats the Examiner to do so the same.